PUBLIC DOCUMENT. No. 31.

TWENTY-THIRD ANNUAL REPORT

OF THE

TRUSTEES

OF THE

MASSACHUSETTS

AGRICULTURAL COLLEGE,

AND

CATALOGUE.

JANUARY, 1886.

BOSTON:
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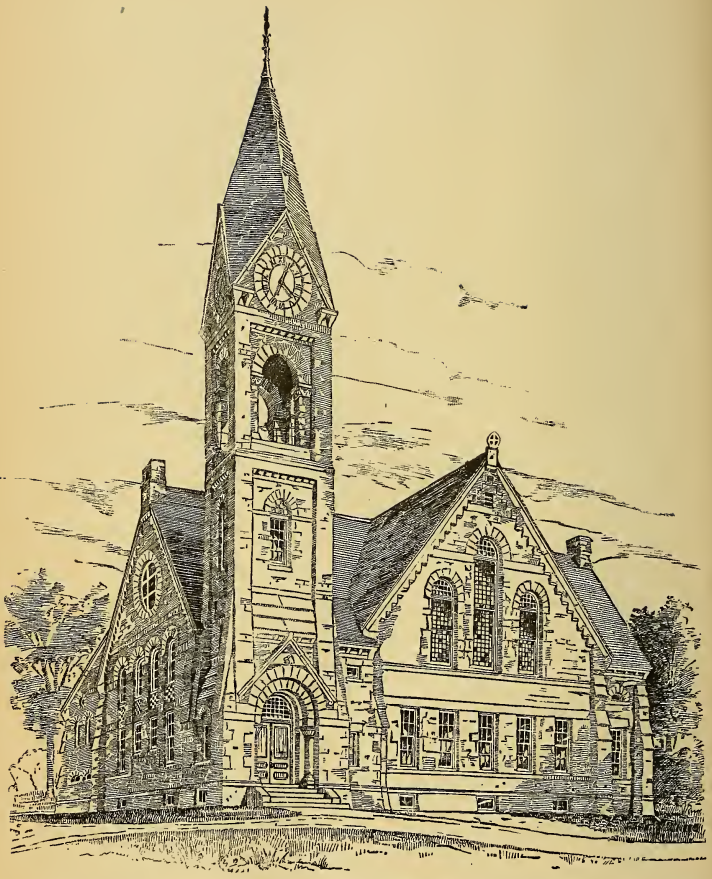

NEW STONE CHAPEL AND LIBRARY BUILDING.

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Commonwealth of Massachusetts.

Massachusetts Agricultural College,
Amherst, Jan. 15, 1886.

To His Excellency Geo. D. Robinson.

Sir: — Herewith I have the honor to present to your Excellency and the Honorable Council the Twenty-third Annual Report of the Trustees of the Massachusetts Agricultural College.

I am, sir, very respectfully,

Your obedient servant,

JAMES C. GREENOUGH,
President Massachusetts Agricultural College.

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ANNUAL REPORT

OF THE

TRUSTEES

OF

MASSACHUSETTS AGRICULTURAL COLLEGE.

To His Excellency the Governor and the Honorable Council:

In the history of the college, the year that has closed must be regarded as a year of progress. The laboratory building has been remodelled and repaired, a very cheerful and convenient dormitory has been planned and will soon be finished, and in a separate wing rooms long needed for instruction are being provided; the new chapel and library building is nearly ready for use; over a thousand volumes have been added to the library; a considerable addition has been made to the scientific apparatus; the productiveness of the farm has been increased; the Durfee Plant House has been repaired and painted inside and out, and furnished with new heating apparatus,— and, more than all these, the college has effectively aided a good number of students in fitting themselves for the duties of life.

OBJECTS OF THE COLLEGE.

The need of colleges better adapted to the education of those who are to engage in the more active pursuits of life, the need of technical training for those who are to engage in agriculture, and the need of men of military training, led to the founding by the United States, with the co-operation of the legislatures of the several States, of this and other similar

colleges. The objects for which the United States made the appropriation for founding and maintaining this college are, as stated in the original bill, "The endowment, support and maintenance of at least one college where the leading object shall be, without excluding scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." In accordance with this act, a four-years' course of study was arranged at the time the college was founded, which from time to time has been somewhat modified as the facilities for instruction have been furnished and as the several departments of science have advanced.

The general purpose of the institution is in good degree indicated by its name. It is a college. It is an agricultural college. As a college, its purpose is the physical, intellectual and moral development of its students. The subjects included in the course are some of the means to be used in securing this end. These subjects are naturally divided into two groups.

The first group includes those subjects that are adapted to give a knowledge of external nature.

In the second group are included those subjects that are adapted to give a knowledge of man.

The first group includes mineralogy and geology, and other subjects pertaining to the inorganic kingdom; physics, pertaining to the motion of masses of matter; chemistry, pertaining to the molecular changes of matter; botany and kindred subjects, pertaining to the vegetable world; zoölogy and kindred subjects, pertaining to the animal world.

In the second group are included the studies of language, mental and moral philosophy, history, political economy, civil government and kindred studies.

A third group would seem to be needed, to make any complete course of study; viz., those studies that pertain to a knowledge of God. But the subjects pertaining to nature and to man, if properly taught, lead to a knowledge of God.

In securing the development of the student as a man, it is

needful that in the college course he gain sufficient knowledge and discipline to enable him, after leaving college, to advance successfully in any one of the departments named. Whatever a course of study includes, its value depends upon its adaptation to develop the powers of the student, and its service as a basis of future progress. Progressive manhood should be the object of every college.

The distinctive feature of this college is that it is an agricultural college. Hence, so far as is practicable, the sciences here taught are taught in their relations to agriculture. The great variety of employments included under the term agriculture, and the rapid advances made in the useful application of the sciences, must render the course both broad and practical. Any attempt to confine the work of the college within narrow technical limits, is contrary to the spirit and intent of the founders, is not in accord with the vast interests it subserves, and is unworthy of those to-day engaged in one of the most honorable and useful employments. There are two classes of persons making demands upon our higher institutions of learning, and especially, I may say, upon an agricultural college.

Those of one class demand that these institutions shall develop the student's powers without reference to any future employment. They demand the culture of the man.

Those of the other class demand practical business results from an education, and judge of the value of a course by the business skill gained in some one employment, and the pecuniary returns it enables one to secure. The demand of each class is reasonable. Knowledge and mental power are of paramount importance, independent of their business applications; and yet the daily needs of our physical and social life require that we use our knowledge for practical ends. While the agricultural college aims to secure the education of its students in the highest and best sense of the term, it also furnishes opportunities to prepare for a useful employment. It does not aim to give mere theoretical knowledge. It aims to teach the sciences in their practical application to at least one employment, and that the fundamental employment of our own and of every other people.

BUILDINGS.

The old chapel building has been changed in its interior construction, and renovated, so that it now contains a lecture-room, a room for drawing, the mathematical recitation-room, the philosophical apparatus room, the chemical lecture-room, the chemical laboratory and various work-rooms. The appropriation of $2,000, made by the legislature of last year, was not sufficient to do all that should be done, but the improvements made will greatly aid our scientific work.

The brick building, partly on the site of the old south dormitory building, is roofed, plastered, and nearly ready for the finish. This building is composed of two wings, joined so as to form a right angle. The dormitory wing, more than 151 feet in length, fronts toward the south, giving a south room for a study-room to every student who shall occupy the building. The bedrooms in the rear of the study-rooms are of good size, and arranged for ample light and ventilation. The building will accommodate forty-eight students when all the rooms are finished.

The lecture-room wing fronts the east, and has in its basement the steam-heating apparatus, the work-room and the agricultural implement room. All of the first floor is devoted to the work of the agricultural department. Here are one lecture-room, two smaller rooms, and a large room for an agricultural museum. In the second story are two rooms for the department of language and literature, and for other departments. A third room in this story will make an admirable room for our collections in natural history, and may also be used for lectures on mineralogy and geology.

The new chapel and library building, which has been delayed because of the erection of the tower, is nearly finished, and will soon be furnished. All the buildings should be connected with each other and with the walk on West Pleasant Street by concrete walks; for this purpose an appropriation of $1,000 will be required. The college grounds should be provided with additional hydrants connected with the water supply of the town of Amherst. Hose and other necessary apparatus should be at hand to protect the build-

ings against loss by fire. An appropriation of $1,000 will be required for this purpose.

COLLEGE FARM.

The real estate connected with the college may be considered under three heads :—

1. That occupied by the Massachusetts Experiment Station, for an account of which we would refer to the annual report of Dr. Goessmann, Director of the Station.

2. That part under the direction of the professor of botany and horticulture, for an account of which we refer to the accompanying annual report of Prof. S. T. Maynard.

3. That part lying west of the county road, or the farm proper. This is now estimated by the professor of agriculture to contain about 233 acres. Some seventy-five or eighty acres of this are now used as mowing and tillage. A large proportion of the land now enclosed as pasture has in former years been cultivated. In fact, whenever the department of practical agriculture shall adopt a system of rotation of crops, for which the improvements made on the farm during the last two years is a good preparation, the land now enclosed as pasture will be available, as well as that now used as mowing and tillage. The lowland in the pasture west of the college buildings was cleared, ditched and put in condition for plowing some years ago, under President Stockbridge. In the autumn of 1883 it was plowed, and in the spring of 1884 it was so seeded that during that season it yielded excellent pasturage. By the maintenance of a system of farming adapted to instruct the students as well as to improve the farm, this lowland, without much expense, can be made very productive land.

Credit is due to Mr. Wright, the farmer, for so managing the farm during the past two years as to double the quantity of hay produced; while the yield of corn the past year is estimated, from measurement in the ear, at upwards of twelve hundred bushels of shelled corn. It is a gratifying fact that the balance sheet at the close of this year is in favor of the farm. There is great need of a good corn-house for the farm, and of more shed room for the storage

of farm implements. The barn needs considerable repairing. Important changes should be made in it, and the buildings connected with it, that they may be more serviceable for instruction, and may better secure economy of labor. It is estimated that not less than twelve hundred dollars will be required for this purpose.

From the time the college was opened, the farm has been used as a means of instruction whenever the professor of agriculture wished so to use it. The present executive committee of the trustees and the president are disposed to aid the professor of agriculture in rendering the farm a more effective means of instruction. The area of the farm, diminished by the separation of the parts above named, makes its care by the professor of agriculture less onerous than in former years, while it may be made equally valuable for educational purposes. In fact, the history of the college furnishes abundant evidence that a much smaller farm would have been far more profitable in many ways. We herewith submit the financial statement for the year ending Dec. 31, 1885: —

	Dr.	Cr.
Cash paid out by Treasurer,	$3,759 70	–
Cash received from sales,	–	$4,152 85
Bills payable,	250 12	–
Bills receivable,	–	337 99
Increase in value of stock,	–	200 00
of tools and implements,	–	100 00
of crops on hand,	–	1,065 00
Balance,	1,846 02	–
	$5,855 84	$5,855 84

From the above it will be seen that the cash balance in favor of the farm is $393.15. Add to this the balance of bills in favor of the college, which are, for the most part, as good as cash within thirty days, and the balance in favor of the farm is $481.02, while the total balance in favor of the farm is $1,846.02.

SCHOLARSHIPS.

Of those who were examined to enter the college last September, twenty-nine were entitled to State scholarships. Twenty-five of these are enrolled in our classes. These students constitute the greater part of the Freshman class. As the examination papers written in the several senatorial districts are now mailed to the college, and there examined, the candidates for scholarships are now admitted on a uniform basis. The ability and earnestness of those who have received scholarships is gratifying. The plan by which scholarships are made available for every section of the State puts the college in close relations to the people of the State. Under this plan a far larger number of those young men for whom the college was intended can avail themselves of its benefits. The distribution of scholarships also tends to diffuse information concerning the college, and is leading to a better appreciation of its work.

IMMEDIATE NEEDS OF THE COLLEGE.

I. The re-enactment of the resolves of 1883, providing for an annual payment "to enable the trustees to provide for the students of said institution the theoretical and practical education required by its charter and the law of the United States relating thereto," and also providing free scholarships.

II. An appropriation of one thousand dollars, to connect the college buildings by suitable walks, and to connect said buildings by walks with the walk on the Amherst highway.

III. An appropriation of twelve hundred dollars, to improve the farm buildings, and put them in good repair.

IV. An appropriation of one thousand dollars, to make the changes and improvements in the Drill Hall advised by Lieut. Sage.

CONCLUDING REMARKS.

The earnestness and the success of the students in the several departments during the year have been worthy of much commendation. With the admirable rooms soon to be completed for the students, and the increased facilities

for instruction now furnished, the college, we believe, will deserve in larger degree the growing patronage which it enjoys. The faculty of the college has suffered but little change. Prof. Horace E. Stockbridge, Ph. D., resigned in April to accept an important position in the Imperial College of Agriculture, Japan. His place has been filled by the appointment of Charles Wellington, Ph. D., of the Class of '73. The detail of Victor H. Bridgman, First Lieutenant, Second Artillery, having expired, Geo. E. Sage, First Lieutenant, Fifth Artillery, has been detailed from the U. S. A. by the Secretary of War, as Professor of Military Science and Tactics.

DEPARTMENT OF PRACTICAL AGRICULTURE.

President JAMES C. GREENOUGH.

SIR:—The following report on the course of instruction in agriculture for the year 1885 is respectfully submitted.

Twelve of the Freshman class of last year, thirteen of the present Sophomore class, sixteen of the present Junior class and all of the Seniors have taken the course in agriculture.

The general plan of class-room instruction presented in outline in former reports has been followed this year with greater satisfaction, as nearly all of the students of the several classes were in their proper place in the course, so that the systematic relations and interdependence of its subdivisions were more readily recognized.

Throughout the entire course practical considerations and principles have been the leading subjects of discussion, and theories have only received a share of attention when they had a direct bearing upon the economies of farm practice.

The uniform attention of the students to the lectures in the several departments of the course, and the interest they have taken in the various topics presented, have been all that could be wished, notwithstanding the many defects in the means of illustration.

During the past term, for the first time in the history of the college, the department of agriculture has had a class-room under its exclusive control; and although these temporary quarters have been crowded and inconvenient, the great advantages of this arrangement over former conditions have been manifest in all class exercises. The agricultural class-room and museum provided for in the new building will furnish better facilities for illustrating the several topics

embraced in the course, which will materially increase the efficiency and influence of the department.

In my report of last year, attention was called to the great importance of biology, in its latest developments, as a subdivision of agricultural science; and I afterwards made an estimate of the apparatus needed in this department, as a basis for legislative appropriations.

This estimate was intended to provide the necessary apparatus for the illustration of the class-room instruction in agriculture, and to furnish facilities for practical laboratory work in biology by a class of from twelve to fifteen students. A part of this apparatus has already been purchased and used during the past term, and experience shows that the original amount asked for is absolutely required to provide suitable appliances for biological work by the students now in the course in agriculture.

If all of the students in the college take the agricultural course, including biology in its relations to agriculture, several hundred dollars more than my original estimate will be needed to provide them all with facilities for work in the biological laboratory.

Instruction in biology has been given by lectures, in which the general principles of the science are discussed, especial prominence being given to subdivisions of the subject that have a direct relation to agricultural problems of practical interest; and the oral instruction is supplemented by laboratory practice, in which the student is required to make original investigations that serve to verify and fix in his mind the leading facts of the science. During the past term the senior class has been making good use of the new apparatus belonging to the department, in the study of microscopic organisms of particular interest to the farmer in the curing and management of dairy products, including the various processes of fermentation and putrefaction, and the specific forms which have been proved to be the causes of some of the most fatal diseases of plants and animals.

They have thus been made familiar with the general appearance and behavior of these minute organisms; and, by making drawings and measurements of the forms under observation, and cultivating them in appropriate media,

under known conditions, they are enabled to trace the life history and specific function of particular species, and determine their distinguishing characteristics which might otherwise escape attention. Original researches have already been begun by some of the students under my advice and supervision, which give promise of valuable results, in relation to the cause of epidemic abortion in cows; and work of this kind may be profitably extended to include the entire range of communicable diseases.

The training of students in the exact methods of investigation required in such studies, is not only of great value to them as an educational factor, but it gives them broader views of the rapidly extending relations of science to agriculture; and the experience gained in observing the influence of a change of conditions upon the vital activity of these lowest forms of life, is the best possible preparation for the intelligent consideration of the means of controlling or preventing the ravages of all communicable diseases.

The interest of the students in this work, the past term, is manifested in the requests made by almost every member of the class that they may be allowed to continue their laboratory work in biology as a special study, during the remainder of their college course. A number of special students have likewise made application for the practical course in biology during the next term.

From the great practical importance of the department of biological science, relating to the causes of communicable diseases, which has been developed within the past few years and is now attracting prominent attention, as a means of solving some of the most difficult problems of sanitary science, to say nothing of the relations of biology to other branches of rural economy,—it seems desirable that provision should be made for the prosecution of biological studies in a well-arranged laboratory, where the apparatus now belonging to the department can be used to the best advantage. A room in the new building should be assigned for this exclusive purpose, as satisfactory work in this direction cannot be carried on in a room used for other purposes; and it must be in immediate connection with the agricultural department, if

the students are to realize the greatest profit from their work under my supervision.

Among the means of illustration and instruction in an agricultural college, the farm should occupy a prominent and commanding position, and its management should be in harmony with the principles taught in the class-room. In its present condition and equipment, the farm must fail to serve its legitimate purpose as a part of the educational facilities of the college; and, in justice to my own department of instruction, it must be said that the professor of agriculture has not been consulted in regard to any detail of farm management, either directly or indirectly, for the past two years.

Of the 383 acres embraced in the college domain, it is estimated that about 150 acres is occupied by the horticultural and experimental departments, and by the college buildings and adjacent grounds and roads, leaving approximately about 233 acres in charge of the farm department.

The land available for cultivation on the farm is only 75 acres, or less than one-third of the area of the farm proper; and nearly one-half of this is in small and irregular plots, of from two to nine acres of the area properly included in the college grounds.

The best land on the farm is now practically a barren waste, which can only be made productive by thorough drainage; and this forms part of an enclosure of about 100 acres, which is used as a cattle range, some parts of which are in grass, that may be converted into a good pasture with a moderate expenditure of labor.

The south part of this enclosure, lying directly west of the college buildings, should be reclaimed by thorough drainage and brought under cultivation, as a matter of economy in providing a variety of work for the students, and distributing it throughout the season.

In the improvement of this tract, the students will have the opportunity for acquiring practical experience in laying tiles; and the subsequent management would serve to show that their labor in such permanent improvements is not unproductive.

The fences on the enclosed part of the farm should be

reconstructed and arranged so that the different fields may be made conveniently accessible.

The barn should be repaired and rearranged to provide better quarters for the live stock of different kinds, and to economize the expenditure of labor in its care and management.

The equipment of implements for the fields and farm buildings should include the latest and most complete apparatus for economizing labor in all departments of the work.

Several breeds of cattle, sheep and swine of the very best quality should be kept on the farm, so that the students may become familiar with the characteristics of the leading types, and their adaptation to particular purposes.

The farmers of the State would likewise be directly benefited by such a collection of pure-bred stock, as they could then conveniently make a comparison of the qualities of the different breeds under favorable conditions; and the college farm would become a centre for the distribution of choice breeding stock to different parts of the State.

MANLY MILES.

BOTANIC DEPARTMENT.

President J. C. GREENOUGH.

SIR: — The following report upon the condition of the Botanic Department is respectfully submitted: —

The class-room work of instruction has been carried out the past year according to the college curriculum.

The field exercises have been much reduced in number and time, on account of the limited time the students have for such work, after attending the regular recitations and the military exercises, the want of proper equipment of tools, and the fact that the time of the instructor has been too much taken up in looking after the details of the trade department and the assigned class-room work.

In order to make the department more efficient, an assistant is needed who can take entire charge of the details of the work in the greenhouses, orchard, nursery and gardens.

The question whether a State institution should conduct business as a means of support is often discussed, and under the present circumstances is a difficult one to settle.

In an industrial institution, such as this was intended to be, all the branches of agriculture and horticulture must be practical; and what is done in this line, aside from experimental and illustrative work, should be done with a view of a profit over and above the cost of production. While the transaction of business seems a necessity, it is found here, as in all other State institutions, that the conditions are such as led one of the ex-governors of Massachusetts to say that he could do more with seventy-five cents of his own money than he could with one dollar belonging to the State.

The amount of business done can be reduced very much, if a plan can be adopted to keep the land now under cultivation in a condition required to interest and instruct both

students and the public; and it would be a welcome relief to those obliged to carry on the work under such disadvantageous circumstances.

I would suggest that some of the above land be devoted to experiments in forestry, and that the original plan be carried out of making an arboretum on some of the land south-east from the president's house. Many very desirable trees and shrubs are already growing in our nursery, and others can be obtained by exchange and otherwise at a very small expense.

The crops the past season have generally been abundant, but owing to low prices the income from sales has been much less than last year.

The orchards, vineyard and small-fruit plantations are in a much improved condition, and a permanent income may now be expected from them without a great expense.

The stock of trees in the nursery is much increased in value, especially in the line of *fruit trees*, of which we can offer a fine stock.

The plants in the large greenhouses have now regained much of their former size and beauty, and require more time and labor to keep in good condition. The propagating pits are well stocked with bedding plants for spring trade and decoration, and with carnations and violets for cut flowers.

The old furnaces in the large houses have been replaced by two new ones, which are working well, and give more heat with a greater economy of fuel.

All the woodwork of both the greenhouses and propagating pits has received a thorough coat of paint, and is much improved in appearance.

An experimental plat in which to test the new varieties of fruits, and to furnish specimens of native grasses and other forage plants, has been laid out north-east of the new stable. In these plats have been planted over 40 new varieties of grapes; 15 new varieties of raspberries and blackberries; 6 new varieties of plums; 10 new varieties of cherries; 8 new varieties of apples; 60 new and standard varieties of strawberries; 10 new and standard varieties of peaches; also, 60 varieties of grasses and forage plants for illustration, and to supply herbarium specimens for students.

All the above have been provided with a large sheet-iron label, painted white, with the name distinctly printed upon each, as have also most of the trees and shrubs in the immediate vicinity of the plant-house and Botanic Museum.

It is hoped that another season we may provide similar labels for all the specimen trees upon the college grounds, so that visitors as well as students may be instructed and entertained.

The financial condition of the department is shown by the following statement: —

STATEMENT.

Dr.

To cash received for trees, plants, fruit, vegetables, etc.,	$4,124 89
To cash collected by bursar for the above,	499 21
	$4,624 10
To the above should be added the following credits: —	
To grading, seeding, etc., about the new stable,	15 00
To preparing and planting experimental plats,	65 00
To trees, plants, etc., for experimental plats,	125 00
To preparing labels for trees, plants, etc.,	75 00
To *estimated* cost of *extra labor* above that necessary to carry on the business, including care of specimen plants in the plant-house, decorating the grounds, taking care of walks and roads, and mowing the lawns about the plant-house and Botanic Museum, etc.,	500 00
To increased value of nursery stock,	250 00
To increased value of orchards, etc.,	250 00
To outstanding bills due,	365 64
Total income,	$6,269 74

Cr.

By bills paid by bursar,	$5,276 06	
By bills paid by Botanic Department,	245 77	
Total expense,		5,521 83
Balance in favor of Botanic Department,		$747 91

S. T. MAYNARD.

CHEMICAL DEPARTMENT.

President JAMES C GREENOUGH.

SIR: — Instruction has been given in the chemical department during the past year to four classes, as follows: —

The Sophomore class has finished its first term in elementary chemistry, having studied chemical phenomena in general, and the properties and behavior of the metalloids. Next term it will study the chemistry of metals.

The Juniors have taken their second term in elementary chemistry, — *i. e.*, the chemistry of metals, — and a term in chemical geology or the study of the formation of arable soils, and next term enter the laboratory for practical work in chemical analysis.

The Senior class has had three terms of laboratory practice, having been required first to study the properties of the commonly occurring elements, both in the dry and humid way, and then to ascertain the qualitative composition of unknown substances, beginning with those of simple character and taking up gradually more complex mixtures, and finally analyzing substances of general and special interest in agricultural economy. In this connection the class have received lectures and have been examined upon the occurrence and composition of the fertilizing materials of our markets, and also upon the best methods in quantitative analysis. Next term this class will study organic chemistry, especially in relation to agricultural pursuits. It is suggested that during their last term in college the Seniors receive instruction in the domain of agricultural chemical industries, — *i. e.*, in the modes of manufacture of sugars, starch, oils, oil-cake, milling products, etc., — and also to a farther extent than is elsewhere possible in the course, in that of fertilizers; such being eminently fitted to bring strikingly before

the student, at the moment of his leaving the more theoretical studies and entering into agricultural practice, the true bearing of the chemistry studied during the course upon a large series of important industries with which his future business will stand in intimate relation.

The graduates of last summer received instruction during the previous winter term in organic chemistry.

A number of resident graduates have studied quantitative analysis.

Instruction in the branches of mineralogy and geology having been placed for the time being, until further provision shall have been made for it, in the charge of this department, advantage is to be taken of the interval which exists in the regular chemical course, between the second terms of the Sophomore and Junior years. In those terms the elements of mineralogy will be considered; then the special character of minerals of importance in agriculture, the building of rocks, the general structure of the earth, the disintegration and breaking down of the rock masses in the formation of various soils, the significance of the presence or absence of various mineral substances in a soil, will be considered in order, and foundation will thus be made for a rational treatment of the doctrine of fertilization.

The assistantship, established in this department early in 1884, became vacant last spring through the resignation of Prof. H. E. Stockbridge, who accepted a call from Japan. Engagement was made with Prof. C. Wellington, who entered upon duty at the beginning of the past term.

Of the fifty-five hundred dollars appropriated at the last session of the General Court for the purchase of scientific apparatus, fifteen hundred were apportioned to this department. Of this amount about one-third has actually been disbursed in the purchase of gas apparatus from the Massachusetts Experiment Station, and the remainder will soon be expended for much-needed apparatus and fixtures.

Very respectfully,

C. A. GOESSMANN.

MATHEMATICAL DEPARTMENT.

President J. C. GREENOUGH.

SIR: — During the past year many improvements have been made in this department. The lecture-room, that has been heretofore a source of inconvenience, is now converted into a suitable and convenient apartment. The physical cabinet has received additional room; new cases have been furnished, and heating facilities increased. A small work-room, with a compartment for electric batteries, has also been suitably fitted up.

The money appropriated by the last legislature will, when expended, furnish apparatus sufficient for illustrating the laws and phenomena in the department of physics. We shall be furnished with new and valuable instruments, for use in mechanics and civil engineering. Arrangements have already been made for purchasing the necessary apparatus. But it should be borne in mind that new applications of principles are constantly being discovered, and new instruments are continually devised and invented for illustration; so that it becomes necessary from time to time to furnish supplementary apparatus.

Hence, a small sum of money should be expended yearly, in order that the college may keep abreast of the scientific progress of the age. The method of instruction has been, in the main, similar to that of the preceding year. The endeavor has always been to use the latest and most improved text-books, and to present each subject under discussion in as clear and practical a manner as possible. It

seems proper to urge again the advisability of raising the standard for admission. The student should have completed algebra, or thoroughly mastered two or three books of geometry, before entering college. This preparation would better enable him to seize and comprehend at once the more difficult subjects that at first present themselves.

Respectfully submitted,

C. D. WARNER.

ANATOMY AND PHYSIOLOGY.

President JAMES C. GREENOUGH.

SIR: — I have the honor to submit the following report: —

During the past year the work of this department has been conducted mainly upon the plan outlined in the last annual report.

Instruction has been given to the Sophomore class in human anatomy (descriptive and microscopic) and physiology, five hours each week during the second term. In addition to the regular course, a special one during this term was given to the Senior class, three hours each week.

The department is now fairly well equipped with books for reference and consultation. During the year several of the more recent standard works on human anatomy, histology, physiology (including physiological chemistry and physiological physics) and comparative zoology were added to the library.

We are sadly deficient in apparatus, and in chemical and physical appliances necessary for purposes of illustration and practical work. A complete set of diagrams or charts, illustrating the anatomy of the human body, are very much needed, as are also a set of carefully mounted microscopic sections, without which it is impossible to teach animal histology intelligently. Very few, if any, of the alcoholic specimens belonging to the college are available for study in the lecture-room. These wants are at present supplied from the private collections of the instructor.

It is intended that the instruction in this department shall form a suitable basis for the subsequent instruction in comparative zoology and veterinary science.

F. TUCKERMAN.

MILITARY DEPARTMENT.

JAMES C. GREENOUGH,
President of the Massachusetts Agricultural Society.

SIR: — I have the honor to submit to you the following report, which will necessarily be brief, as I have been connected with the college only two months.

I am fortunate in succeeding an officer of the marked ability displayed by Lieut. Bridgman in the administration of the affairs of the corps, which I find in a most satisfactory condition.

Since taking charge of this department, I have occupied myself with such drills and exercises as would give me a more intimate acquaintance with the individuals of the corps, with the view of observing the effect of the military exercises upon them. There can be no doubt in the mind of any close observer that every member of this corps has been vastly improved by his military training. They are strong, sturdy, well set-up young men, who in after life will find themselves well repaid for the short time spent in uniform.

As yet, I have had no opportunity of meeting the two higher classes, as their course of study had been marked out before I arrived; but I hope that the course of instruction for the winter term will be so arranged that the Seniors will have at least two hours each week to devote to the study of the following subjects: Ordnance and gunnery, constitutional and military law, campaigns and battles, and an elementary course in strategy and engineering. The government expects that the graduates of this college will be able, in time of public need, to take positions as company and field

officers in State regiments that may suddenly be called into the field; and, in order to fit them for these positions, the above studies are absolutely necessary.

In cases of emergency, it is the officers that are required by the State; and if none are found already fitted to take command, they must be educated in the field with the loss of life, time and money, of which our late civil war furnishes a conspicuous example.

I desire also to call your attention to the necessity of heating the drill hall. Under ordinary circumstances, the exercise given by the drill is sufficient to keep the cadets warm; but the most of the drills that occur in winter are of such a character (bayonet and sabre) that it is impossible to keep comfortably warm.

The drill hall can be ceiled with matched spruce lumber, for five hundred dollars, which would greatly improve the appearance and increase the usefulness of the building Then, if properly heated, it would be all that is required for the purpose.

In this connection I would urge the importance of adding to the drill hall a gymnasium, which I believe is an important feature in college education. Great interest is taken in this matter by the students, who show a disposition to raise money for this purpose themselves; but I think it better to refer it to you, hoping you will give your approval and assistance in forwarding the undertaking. The frame of the building is well suited to the requirements of a gymnasium, and the necessary apparatus could be so arranged as not to interfere with the military exercises in any way.

The records of this office show that a continuous effort has been made to put the corps in camp at Framingham with the Massachusetts State militia. It is highly desirable that a certain amount of military instruction should be given in camp, and if it is found impracticable to do this, I would recommend that a sufficient amount of camp and garrison equipage be drawn from the Quartermaster-General of the U. S. Army to encamp the corps on the college grounds, for at least two weeks either in June or September. An insight into the life of a soldier could be given, and such

camp duties taught as would not interfere with the regular college course. This knowledge would be invaluable to the cadet should he ever be called into active service.

THEORETICAL AND PRACTICAL COURSE OF INSTRUCTION.

THEORY.

Fall term, Freshman year. One hour per week for the term. Recitations in Upton's Infantry Tactics. School of the soldier. School of the company. Skirmish drill.

Fall term, Sophomore year. One hour per week, half term. Recitations in U. S. Artillery tactics. School of the soldier. Sabre exercise. Manual of the piece.

PRACTICE.

All students (unless physically disqualified, and furnished with a surgeon's certificate to that effect) will be required to attend all military duties and exercises, those pursuing a special or partial course not being exempt so long as they remain at the college. By the commencement of the second term students are required to provide themselves with a full uniform, comprising coat, blouse, trousers, cap, white gloves, etc., all of which costs about thirty dollars. All students are expected to conduct themselves in a quiet, orderly, and gentlemanly manner. The routine of duty as practised at the Military Academy will be followed as closely as possible. To insure a proper sanitary condition of the college buildings, each Saturday the commandant makes a careful inspection of all rooms and college buildings, during which time all students in full uniform are required to be in their rooms, for the proper police of which they are held strictly accountable. At the beginning of each term, issues of such equipments as they will require are made to all students. They will be charged for all injury, loss, and any neglect of the same.

For practical instruction, the following public property is in the hands of the college authorities: —

One platoon light Napoleons (light twelve).

Seventy-five sabres and belts.

One hundred breech-loading rifles, calibre forty-five.

Several accurate target rifles.

Two eight-inch siege mortars, with complete equipments.

For practice firing, the United States furnishes blank cartridges for all guns, and ball cartridges for rifle practice, which is encouraged by the department.

Drills, amounting to about four hours a week, are as follows: —

Infantry: school of the soldier, company and battalion; manual of arms and sword; bayonet exercise, skirmish drill, target practice; ceremonies.

Artillery: school of the soldier; detachment and battery and sabre exercise; battalion organization.

For instruction in infantry tactics, the cadets are organized in a battalion of two or more companies under the commandant. The commissioned officers of the corps are selected from those cadets who show the greatest aptitude for military duty and ability to impart the knowledge to others. All officers are in turn placed in command of the battalion, and are at all times liable to be called upon to perform staff and field duties. The commissioned officers are chosen from the Senior class, the sergeants from the Junior class, and the corporals from the Junior and Sophomore classes.

Commissioned Staff.

Richard F. Duncan, *First Lieutenant and Adjutant.*
David F. Carpenter, *First Lieutenant and Quartermaster.*

Non-commissioned Staff.

James M. Marsh, *Sergeant Major.*
Joseph S. Martin, *Quartermaster Sergeant.*

Captains.

Winfield Ayers, Co. A. R. B. Macintosh, Co. B.
George S. Stone, Co. C.

Lieutenants.

William H. Atkins, Co. A. Charles W. Clapp, Co. B.
Charles F. W. Felt, Co. C.

First Sergeants.

Herbert J. White, Co. A. Kingsbury Sanborn, Co. B.
Edward W. Barrett, Co. C.

Sergeants.

J. C. Osterhout, Co. A.
Frank S. Clarke, Co. A.
C. W. Fisherdick, Co. B.
T. F. B. Meehan, Co. B.
A. L. Almeida, Co. C.
H. N. W. Rideout, Co. C.

Corporals.

E. F. Richardson, Co. B.
C. L. Marshall, Co. B.
F. C. Allen, Co. C.
F. A. Davis, Co. A.
A. F. Worthington, Co. A.
G. W. Cutler, Co. C.

Very respectfully, your obedient servant,

GEO. E. SAGE,
First Lieutenant 5th Artillery.

Statement of Cash Receipts and Expenses of the Mass. Agricultural College for the Year ending Jan. 1, 1886.

	Receipts.	Payments.
Cash in hands of treasurer, Jan. 1, 1885,	$239 99	–
Cash in hands of bursar, " "	166 11	–
Botanic account,	4,373 38	$5.275 06
Farm account,	4,152 85	3,759 70
Term bill account,	3,970 75	1,652 18
Expense account,	206 00	6,038 48
Boarding-house account,	1,171 43	2,372 76
Laboratory account,	416 16	470 27
Mary Robinson Fund account,	32 00	60 00
Farnsworth Prize account,	50 00	50 00
Grinnell Prize account,	30 00	65 00
Hills Fund account,	630 00	432 48
Whiting Street Fund account,	40 00	–
Salary account,	–	12,998 30
Insurance account,	500 00	369 99
President's House account,	–	480 07
Repairs of North College, etc., account,	–	104 59
State treasurer, scholarships appropriation,	10,000 00	–
State treasurer, income of endowment fund,	10,265 53	–
Interest account, — received on deposits in bank,	280 68	–
Cash on hand, Jan. 1, 1886,	–	2 396 00
	$36,524 88	$36,524 88

Insurance Account.

	Receipts.	Payments.
Received insurance on building, minerals, etc.,	$17,513 00	–
Paid to bursar, Mass. Agricultural College,	–	$500 00
Balance on hand, Jan. 1, 1886,	–	17,013 00
	$17,513 00	$17,513 00

Amherst, Mass., Jan. 1, 1886.

CATALOGUE

OF

TRUSTEES, OVERSEERS, FACULTY AND STUDENTS.

—

1885.

CALENDAR FOR 1886.

January 6, Wednesday, winter term begins, at 8.15 A. M.

March 26, Friday, winter term closes, at 10.30 A. M.

April 6, Tuesday, summer term begins, at 8.15 A M.

June 20, Sunday,
- Baccalaureate Sermon.
- Address before the Christian Union.

June 21, Monday,
- Grinnell Prize Examination of Senior Class in Agriculture.
- Military Exercises.
- Farnsworth Prize Speaking.

June 22, Tuesday,
- Meeting of the Alumni.
- Commencement Exercises.
- Alumni Dinner.
- President's Reception.

June 23, Wednesday, Examination for admission, at 9 A. M.

September 7, Tuesday, Examination for admission, at 9 A. M.

September 8, Wednesday, fall term begins, at 8.15 A. M.

December 17, Friday, fall term closes, at 10.30 A. M.

1887.

January 5, Wednesday, winter term begins, at 8.15 A.M.

March 25, Friday, winter term closes, at 10.30 A.M.

TRUSTEES, OVERSEERS, FACULTY AND STUDENTS.

Board of Trustees.

MEMBERS EX-OFFICIIS.

His Excellency GEO. D. ROBINSON, *Governor of the Commonwealth.*
JAMES C. GREENOUGH, *President of the College.*
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S. B. BIRD,	Framingham.
J. HENRY GODDARD,	Barre.

Members of Faculty.

JAMES C. GREENOUGH, M. A.,
President.
College Pastor and Professor of Mental and Moral Science, Provisional Instructor in History and Political Economy.

LEVI STOCKBRIDGE,
Honorary Professor of Agriculture.

HENRY H. GOODELL, M. A.,
Professor of Modern Languages and English Literature.

CHARLES A. GOESSMANN, Ph. D.,
Professor of Chemistry.

SAMUEL T. MAYNARD, B. S.,
Professor of Botany and Horticulture.

MANLY MILES, M. D.,
Professor of Agriculture.

CLARENCE D. WARNER, B. S.,
Professor of Mathematics and Physics.

CHARLES WELLINGTON, PH. D.,
Associate Professor of Chemistry.

Professor of Comparative Anatomy and Veterinary Science.

FIRST LIEUTENANT GEORGE E. SAGE, Fifth Artillery, U. S. A.,
Professor of Military Science and Tactics.

FREDERICK TUCKERMAN, M. D.,
Lecturer on Anatomy and Physiology.

JOHN M. CLARKE, M. A.,
Lecturer on Geology and Zoology.

FREDERICK E. RICE, D. V. S.
Lecturer on Veterinary Science and Practice.

Graduates of 1885.*

Allen, Edwin West (Boston Univ.),	Amherst.
Almeida, Luciano José de (Boston Univ),	Bananal, São Paulo, Brazil.
Barber, George Holcomb (Boston Univ.),	Glastonbury, Conn.
Browne, Charles William (Boston Univ.),	Salem.
Goldthwait, Joel Ernest (Boston Univ.),	Marblehead.
Howell, Hezekiah (Boston Univ.),	Blooming Grove, N. Y.
Leary, Lewis Calvert (Boston Univ.),	Amherst.
Phelps, Charles Shepard (Boston Univ.),	Florence.
Taylor, Isaac Newton, Jr. (Boston Univ.),	Northampton.
Tekirian, Benoni (Boston Univ.),	Yozgad, Turkey.
Carruth, Herbert Schaw ('75),	Boston.
Total,	11

* The Annual Report, being made in January, necessarily includes parts of two academic years; and the catalogue gives the names of such students as have been connected with the college during any portion of the year 1885.

Senior Class.

Atkins, William Holland,	Westfield.
Ayres, Winfield,	Oakham.
Barker, John King,	Three Rivers.
Carpenter, David Frederic,	Millington.
Clapp, Charles Wellington,	Montague.
Duncan, Richard Francis,	Williamstown.
Eaton, William Alfred,	Piermont-on-Hudson, N. Y.
Felt, Charles Frederic Wilson,	Northborough.
Mackintosh, Richards Bryant,	Dedham.
Sanborn, Kingsbury,	Lawrence.
Stone, George Edward,	Spencer.
Stone, George Sawyer,	Otter River.
Wheeler, George Waterbury,	Deposit, N. Y.
Total,	13

Junior Class.

Allen, Frederick Cunningham,	West Newton.
Almeida, Augusto Luis de,	Bananal, São Paulo, Brazil.
Ateshian, Osgan Hagope,	Sivas, Turkey.
Ball, William Monroe,	Amherst.
Barrett, Edward William,	Milford.
Brown, Frederick Willard,	West Medford.
Caldwell, William Hutson,	Peterborough, N. H.
Carpenter, Frank Berton,	Leyden.
Chapin, Clinton Gerdine,	Chicopee.
Chase, William Edward,	Warwick.
Clarke, Frank Scripture,	Lowell.
Davis, Fred Augustus,	Lynn.
Fisherdick, Cyrus Webster,	Monson.
Fowler, Fred Homer,	North Hadley.
Hathaway, Bradford Oakman,	New Bedford.
Howe, Clinton Samuel,	Marlborough.
Kinney, Arno Lewis,	Lowell.
Long, Stephen Henry,	East Shelburne.
Marsh, James Morrill,	Lynn.
Marshall, Charles Leander,	Lowell.
Martin, Joseph,	Marblehead.
Meehan, Thomas Francis Benedict,	Boston.
Osterhout, Jeremiah Clark,	Lowell.
Paine, Ansel Wass,	Boston.
Rice, Thomas, second,	Shrewsbury.
Rideout, Henry Norman Waymouth,	Quincy.
Shaughnessy, John Joseph,	Stow .
Tolman, William Nichols,	Concord.
Torelly, Firmino da Silva,	Rio Grande do Sul, Brazil.
White, Herbert Judson,	Wakefield.
Total,	30

Sophomore Class.

Ayre, Warren,	Lawrence.
Belden, Edward Henry,	North Hatfield.
Cooley, Fred Smith,	Sunderland.
Cutler, George Washington,	Waltham.
Dickinson, Edwin Harris,	North Amherst.
Dole, Edward Johnson,	Chicopee.
Field, Samuel Hall,	North Hatfield.
Foster, Francis Homer,	Andover.
Hayward, Albert Irving,	Ashby.
Hinsdale, Rufus Chester,	Greenfield.
Johnson, Irving Halsey,	Newburyport.
Kinney, Lorenzo Foster,	Worcester.
Knapp, Edward Everett,	East Cambridge.
Loomis, Herbert Russell,	North Amherst.
Newman, George Edward,	Newbury.
Noyes, Frank Frederick,	South Hingham.
Parker, James Southworth,	Great Barrington.
Richardson, Evan Fussell,	East Medway.
Rogers, Howard Perry,	Allston, Boston.
Shepardson, William Martin,	Warwick.
Shimer, Boyer Luther,	Redington, Pa.
Watson, Charles Herbert,	Groton.
White, Henry Kirke,	Whately.
Worthington, Alvan Fisher,	Dedham.
Total,	24

Freshman Class.

Adams, George Albert,	Winchendon.
Alger, George Ward,	West Bridgewater.
Alger, Isaac, Jr.	Attleborough.
Blair, James Roswell,	Warren.
Bliss, Clinton Edwin,	Attleborough.
Bliss, Herbert Charles,	Attleborough.
Brooks, Frederick Kimball,	Haverhill.
Colcord, Wallace Rodman,	Dover.
Copeland, Arthur Davis,	Campello.
Crocker, Charles Stoughton,	Sunderland.
Davis, Franklin Ware,	Tamworth, N. H.
Hartwell, Burt Laws,	Littleton.
Holt, Jonathan Edward,	Andover.
Hubbard, Dwight Lauson,	Amherst.
Huse, Frederick Robinson,	Winchester.
Hutchings, James Tyler,	Amherst.
Kellogg, William Adams,	North Amherst.
Lumbard, Joseph Edward,	Boston.

Miles, Arthur Lincoln,	Rutland.
Mishima, Yataro,	Tokio, Japan.
Moore, Robert Bostwick,	Framingham.
Okami, Yoshiji,	Tokio, Japan.
Parsons, Wilfred Atherton,	Southampton.
Sellew, Robert Pease,	East Longmeadow.
Smith, James Robert,	Walpole.
Sprague, William Arnold,	Chepachet, R. I.
Taylor, Fred Leon,	North Amherst.
Waite, Herbert Harold,	Belchertown.
Wells, Charles Otis,	Hatfield.
Wentworth, Elihu Francis,	Canton.
White, Louis Allis,	Whately.
Whitney, Charles Albion,	Upton.
Total,	32

Resident Graduates.

Allen, B.S., Edwin West (Boston Univ.),	Amherst.
Jaqueth, Isaac Samuel,	Amherst.
Kingman, B.S., Morris Bird,	Amherst.
Lindsey, B.S., Joseph Bridgeo (Boston Univ.),	Marblehead.
Nourse, B.S., David Oliver (Boston Univ.),	Bolton.
Phelps, B.S., Charles Shepard (Boston Univ.),	Florence.
Preston, B.S., Charles Henry (Boston Univ.),	Danvers.
Smith, B.S., Llewellyn,	Amherst.
Stone, B.S., Winthrop Ellsworth,	Amherst.
Wheeler, George Waterbury,	Deposit, N. Y.
Wheeler, B.S., Homer Jay (Boston Univ.),	Bolton.
Total,	11

Summary.

Resident Graduates,	11
Graduates of 1885,	11
Senior Class,	13
Junior Class,	30
Sophomore Class,	24
Freshman Class,	32
Total,	121

COURSE OF STUDY AND TRAINING.

Freshman Year.

Fall Term.

ALGEBRA. — Wells' University Algebra.

BOTANY. — Structural Botany and the study of the functions of vegetable organisms.

FRENCH. — Principles and applications of grammar, pronunciation, oral and written exercises in translating from French into English and from English into French. Whitney's French Grammar. Readings from French authors.

HISTORY. — Ancient Greece and Rome, with reference to modern institutions. Modes of life and institutions of the Middle Ages with reference to the evolution of our political and other institutions.

Winter Term.

PLANE GEOMETRY AND THEORY OF EQUATIONS. — Wentworth's Geometry.

FREE-HAND DRAWING. — White's Series. Object Drawing and Original work.

FRENCH. — Translations, oral and written, from French into English.

HISTORY. — Beginnings of Modern History. Period of the Protestant Revolution. Thirty Years' War. Development of the nationalities of Western Europe. Progress of civil freedom.

ZOOLOGY AND ENTOMOLOGY. — General classification of animals. Insects injurious to vegetation. Orton's Zoology. Packard's Guide to Study of Insects.

Summer Term.

SOLID GEOMETRY AND CONIC SECTIONS. — Wentworth's Geometry.

BOTANY. Analysis. Systems of classification. Practical exercises in classification and in collecting and arranging herbaria. Bessey's Botany. Gray's Manual.

FRENCH. — Translation of some scientific or historic work, as Puydt Les Plantes de Serre.

AGRICULTURE. — History of Domestic Animals Characteristics and development of different breeds, illustrated by stock of the college farm and by stereopticon views of photo-portraits of typical forms. Class work on the farm during the term as directed.

Sophomore Year.

Fall Term.

PLANE TRIGONOMETRY — Griffin's Conic Sections. Wells's Trigonometry.

BOTANY. — Systematic Botany. Special study of useful and common plants. Bessey's Botany. How Plants Grow, by Johnson.

CHEMISTRY. — Elementary Inorganic Chemistry. Instruction given by lectures and text-book, and all important facts experimentally demonstrated. Introduction to the Study of Chemistry. Nomenclature. Symbols. Atomic Weights. Water and its constituents. Air and its constituents. Quantivalence. Radicals. Stoichiometry. Acids. Bases. Salts. Consecutive consideration of the non-metallic elements.

GERMAN. — Whitney's Grammar. Boisen's Reader. Oral and written exercises.

AGRICULTURE. — Stock breeding; laws of heredity; causes of variation; in-and-in breeding and cross-breeding; form of animals as an index of qualities; selection and care of animals; feeding for meat production; the dairy and its work. Class work on the farm during the term as directed.

Winter Term

MENSURATION AND ASTRONOMY. — Measurement of lines, angles, surfaces, solids and volumes. Wells's Trigonometry.

CHEMISTRY. — Metals of the alkalies. Metals of the alkaline earths. Metals of each succeeding group considered distinctively. Each element and subject is first treated from a theoretical standpoint, and then the agricultural and technical significance of the facts learned are considered.

MECHANICAL DRAWING. — White's Series. Use of instruments. Building plans, specifications, etc.

GERMAN. — Eichendorff. Aus dem Leben eines Taugenichts. Oral and written exercises.

AGRICULTURE. — History of Agriculture, with particular reference to the development of systems and rules of practice. Pioneer farming, its methods and results. Mixed husbandry, — general principles and their special applications; cereals, forage crops, pastures and meadows. Drainage, general principles; different kinds of drains; laying out and construction of drains; improved methods of laying tile drains.

Summer Term.

CIVIL ENGINEERING AND ROAD MAKING. — Practical work with instruments in measuring heights and distances. Plane and topographical surveying, levelling, construction of railroad curves, embankments and excavations, drainage, etc Davies' Surveying.

GERMAN. — Rau. Die Grundlage der Modernen Chemie. Oral and written exercises.

HORTICULTURE. — Cultivation and propagation of fruits. Lectures, with oral and written abstracts.

MINERALOGY. — Elements. Crystallography. Minerals of general interest and of special agricultural importance. Demonstration of functions of minerals in connection with soils. Practical work.

Junior Year.

Fall Term.

MECHANICS. — Lectures. Oral and written abstracts. Dana's Mechanics.

HORTICULTURE. — Market gardening and floriculture.

GEOLOGY. — Structural and chemical. History of the formation of the earth's crust. Formation of rocks from minerals. Classification of rocks according to their practical significance. Weathering and breaking down of rocks. Formation of agricultural soils. Varieties of soils. Characteristics and value of the same. Demonstrations and practical work.

RHETORIC.

Winter Term.

PHYSICS. — Atkinson's Ganot's Physics, new edition.

CHEMISTRY. — Instruction in the laboratory, with recitations. Blowpipe analysis, with the determination of the characteristics of the more common metals and minerals. Determination of unknown substances. Humid analysis. Determination of characteristics of all the commonly occurring elements. Determination of bases and acids in known compounds.

AGRICULTURE. — Soils; farm implements; manures; rotation of crops; methods of agricultural improvement.

VETERINARY SCIENCE. — Lectures.

Summer Term.

CHEMISTRY. — Determination of qualitative composition of unknown substances. Analysis of fertilizers, of soils, and of agricultural and technical raw products.

HORTICULTURE. — Forestry and landscape gardening. Methods of propagation and cultivation of forest trees. Study of trees and plants most desirable for land decoration, with principles and rules of arrangement. Lectures, with oral and written abstracts. Hough's Elements of Forestry.

ANALYTICAL GEOMETRY.

METEOROLOGY.

ANATOMY AND PHYSIOLOGY. — Descriptive anatomy by means of skeletons, elastic models, fresh specimens, dissection, diagrams and charts. Lectures and discussion of topics. Microscopic anatomy. Chemical analysis.

Senior Year.

Fall Term.

CHEMISTRY. — Analysis of prominent products of chemical industry. Special lectures upon the same.

MENTAL SCIENCE. — Outline by inductive teaching, and by lectures. Study of topics aided by Porter, Cousin, Hamilton, etc. Oral recitations by topics and written abstracts. History of philosophy. Lectures.

BIOLOGY. — Its relations to agriculture. Laws of growth and development; relations of living organisms to farm practice; communicable diseases of plants and animals, illustrated by laboratory practice and experiments.

Winter Term.

CHEMISTRY. — Organic chemistry with reference to applications in agriculture and other industries.

POLITICAL ECONOMY. — Treatment of the subject by lectures, discussions and abstracts. Laughlin's Mill's Political Economy. Perry's, Newcomb's.

PRINCIPLES OF LAW. — Lectures.

ENGLISH LITERATURE. — Lectures on the early history of the English nation, and formation of the language. Study of the early literature.

Summer Term.

MORAL SCIENCE. — Outline of principles by inductive teaching and by lectures. Discussions. Recitations by topics and by abstracts. Philosophic Basis of Theism, by Harris. Hopkins' Law of Love.

CONSTITUTIONAL HISTORY. — Origin and development of the English Constitution. Colonial governments. Government of the United States. History of political parties. Development of popular governments in Europe during the present century.

ENGLISH LITERATURE. — Study of Shakespeare. Lectures on the historic epochs in connection with the text-book.

AGRICULTURE. — Principles of farm economy; systems of farm practice; buildings, plans and construction; applications of sanitary principles; farm machinery. Review and discussion of the relations of the several topics of the course.

In all studies, students are to be trained to accurate and ready oral and written expression, and to use drawing as language. Military tactics and military drill, as ordered, throughout the course. Weekly exercises in compositions and declamations throughout the course. The instruction in agriculture and horticulture is both theoretical and practical. Instruction in the field and manual training is given whenever such instruction and training will conduce to the progress of the student. Students are allowed to work for wages during such leisure hours as are at their command. A limited amount of work has been found to be beneficial, but work that withdraws the energy of the student from his studies is unprofitable to him. Students sometimes earn from fifty to one hundred dollars per annum.

ADMISSION.

Candidates for admission to the Freshman Class are examined orally and in writing, upon the following subjects: English Grammar, Geography, Arithmetic, Algebra to quadratic equations, the History of the United States, and the Metric System.

Candidates for higher standing are examined as above, and also in the studies gone over by the class to which they may desire admission.

No one can be admitted to the college until he is fifteen years of age. Every applicant is required to furnish a certificate of good character from his late pastor or teacher. Candidates are requested to furnish the Examining Committee with their standing in the schools they have last attended. The previous rank of the candidate will be considered in admitting him.

GRADUATION.

Those who complete the course receive the degree of Bachelor of Science, the diploma being signed by the Governor of Massachusetts, who is president of the corporation.

Regular students of the college may also, on application, become members of Boston University, and, upon graduation, receive its diplomas in addition to that of the college, thereby becoming entitled to all the privileges of the alumni.

POST-GRADUATE COURSES.

Graduates of colleges and scientific schools may pursue their studies under Professor Goessmann in chemistry, under Professor Tuckerman in histology and anatomy, and under other members of the Faculty in their several departments.

EXPENSES.

Tuition in advance.			
Fall term,	$30 00		
Spring term,	25 00		
Summer term,	25 00	$80 00	$80 00
Room-rent, in advance, $5.00 to $10.00 per term,		15 00	30 00
*Board, $3.50 to $5.00 per week,		133 00	190 00
Washing, 30 to 50 cents per week,		11 40	19 00
Fuel, $5.00 to $15.00 per year,		5 00	15 00
Expense per year,		$244 40	$334 00

To the above must be added thirty dollars to obtain a military suit, which is to be obtained during the first term of attendance at college, and is to be used in drill exercises during the four-years' course. Those who use the laboratory for practical chemistry will be charged ten dollars per term. Some expense will also be incurred for lights and for text-books. Students whose homes are within the State of Massachusetts, can in most cases obtain a scholarship by applying to the senator of the district in which they live. The outlay of money can be further reduced by work during leisure hours on the farm or in the botanic department. The opportunities for such work are more abundant during the Fall and Summer terms.

SIZE OF ROOMS.

For the information of those desiring to carpet their rooms, the following measurements are given. In the new south dormitory, the study-rooms are about fifteen by fourteen feet, with a recess seven feet four inches by three feet, and the bedrooms are eleven feet two inches by eight feet five inches. In the north dormitory the corner rooms are fourteen by fifteen feet, and the annexed bedrooms eight by ten feet; while the inside rooms are thirteen feet and a half by fourteen feet and a half, and the bedrooms eight by eight feet.

THE ROBINSON SCHOLARSHIP.

The income of the Robinson Fund of one thousand dollars, the bequest of Miss Mary Robinson of Medfield, is assigned by the Faculty to such indigent student as they may deem most worthy.

* Several students, during most of the year, have formed a club and furnished themselves with board for about two dollars and fifty cents per week.

CONGRESSIONAL SCHOLARSHIPS.

The trustees voted in January, 1878, to establish one free scholarship for each of the eleven congressional districts of the State. Applications for such scholarships should be made to the representative from the district to which the applicant belongs. The selection for these scholarships will be determined as each member of Congress may prefer; but, where several applications are sent in from the same district, a competitive examination would seem to be desirable. Applicants should be good scholars, of vigorous constitution, and should enter college with the intention of remaining through the course, and then engaging in some pursuit connected with agriculture.

STATE SCHOLARSHIPS.

The legislature of 1883 passed the following Resolve in favor of the Massachusetts Agricultural College: —

Resolved, That there shall be paid annually, for the term of four years, from the treasury of the Commonwealth to the treasurer of the Massachusetts Agricultural College, the sum of ten thousand dollars, to enable the trustees of said college to provide, for the students of said institution, the theoretical and practical education required by its charter and the law of the United States relating thereto.

Resolved, That annually for the term of four years, eighty free scholarships be and hereby are established at the Massachusetts Agricultural College, the same to be given by appointment to persons in this Commonwealth, after a competitive examination, under rules prescribed by the president of the college, at such time and place as the senator then in office from each district shall designate; and the said scholarships shall be assigned equally to each senatorial district; but if there shall be less than two successful applicants for scholarships from any senatorial district, such scholarships may be distributed by the president of the college equally among the other districts, as nearly as possible; but no applicant shall be entitled to a scholarship unless he shall pass an examination in accordance with the rules to be established as herein before provided.

In accordance with these resolves, any one desiring admission to the college can apply to the senator of his district for a scholarship.

LIBRARY.

The library now numbers forty-four hundred volumes. It has for the first time been made available to the general student, having been classified and catalogued according to the Dewey system. It is especially valuable as a library of reference, and every effort will be made to make it complete in the departments of agriculture, horticulture and botany.

APPARATUS AND COLLECTIONS.

The Class in Microscopy has the use of Tolles's best compound microscopes, with objectives from four inches to one-eighth of an inch in focal distance, and a variety of eye-pieces. Valuable apparatus has recently been purchased, for the use of the class in biology.

The **State Cabinet** of specimens, illustrating the geology and natural history of Massachusetts, has been removed from Boston to the college, and is of much value for purposes of instruction. This collection has from time to time received valuable additions.

The **Knowlton Herbarium** contains more than ten thousand species of named botanical specimens, besides a large number of duplicates. The Botanic Museum is supplied with many interesting and useful specimens of seeds, woods and fruit-models. There is also a set of diagrams illustrating structural and systematic botany, including about three thousand figures.

About **Fifteen Hundred Species and Varieties of Plants** are cultivated in the Durfee Plant-house, affording the student an invaluable opportunity of studying the most important types of the vegetable kingdom in their scientific and economic relations. Upon the grounds of the botanic department are cultivated a great variety of trees, shrubs and plants.

PRIZES.

Farnsworth Rhetorical Prizes.

Isaac D. Farnsworth, Esq., of Boston, has generously provided a fund of fifteen hundred dollars, the income of which is to be used as prizes, to be annually awarded, under the direction of the College Faculty, for excellence in declamation.

Grinnell Agricultural Prizes.

Hon. William Claflin of Boston has given the sum of one thousand dollars for the endowment of a first prize and a second prize, to be called the Grinnell Agricultural Prizes, in honor of George B. Grinnell, Esq., of New York. These prizes are to be paid in cash to those two members of the graduating class who may pass the best oral and written examination in theoretical and practical agriculture.

Hills Botanical Prizes.

For the best herbarium collected by a member of the class of 1886, a prize of fifteen dollars is offered, and for the second best a prize of ten dollars; also a prize of five dollars for the best collection of woods, and a prize of five dollars for the best collection of dried plants from the college farm.

The Clark Prize.

A prize of twenty-five dollars is offered to that member of the Sophomore class who passes the best examination in human anatomy and physiology. This prize is named in memory of Henry James Clark, the eminent biologist, who was the first professor of natural history at the college.

The prizes in June, 1885, were awarded as follows: —

Farnsworth Prizes. — 1. To Herbert Judson White; 2. To Osgan Hagope Ateshian, of the class of 1887. 1. To Warren Ayre; 2. To Francis Homer Foster, of the class of 1888.

Grinnell Prizes. — 1. To Benoni Tekirian; 2. To Charles Shepard Phelps, of the class of 1885.

Hills Prize to Hezekiah Howell, of the class of 1885.

Military Prizes. — 1. To Joel Ernest Goldthwait; 2. To Isaac Newton Taylor, Jr, of the class of 1885.

PHYSICAL CULTURE.

The military exercises in the open air, or in a spacious hall provided for the purpose, tend to promote health, erect form, and prompt, effective and graceful movement.

RELIGIOUS SERVICES.

Chapel exercises every morning at a quarter after eight o'clock. On Sundays the students attend morning service in the chapel, unless, by request of their parents, arrangements are made to attend church elsewhere. On Sabbath afternoons, or immediately following the morning service, there is opportunity for every student to study the Bible in a Bible Class.

The Young Men's Christian Association holds weekly meetings. The Sabbath evening services in churches about one mile distant, and meetings conducted by the students, furnish additional opportunities for religious culture.

CONDUCT.

Students are expected to co-operate with their instructors and with each other in promoting the welfare of the college, in order that every student may receive the best possible results of the course of study and training. Whenever it is evident that it is not for the good of a student to remain in the college, or that the welfare of the college requires that he should not remain, he will be dismissed.

LOCATION.

Amherst is on the New London & Northern R.R., connecting at Palmer with the Boston & Albany R.R., and at Miller's Falls with the Fitchburg R.R. A stage route of seven miles connects Amherst at Northampton with the Connecticut River R.R., and with the New Haven & Northampton R.R. The college buildings are on a healthful site commanding one of the finest views in New England. The large farm of three hundred and eighty-three acres, with its varied surface and native forests, gives the student the freedom and the quiet of a country home. The surrounding country is very helpful to the student of natural science. The location of the buildings prevents the student from the interruptions to study, incident on residence in a town or city, and helps to secure all the moral as well as the intellectual advantages of a college in the country.

COMMENCEMENT EXERCISES — 1885.

BACCALAUREATE SERMON, by the PRESIDENT, Sunday Morning, June 21.

ADDRESS BEFORE THE CHRISTIAN UNION, by PROF. A. P. PEABODY, D. D., Preacher to Harvard University, Sunday Evening, June 21.

GRADUATING EXERCISES, TUESDAY MORNING, JUNE 23.

PROGRAMME.

Music.

ISAAC NEWTON TAYLOR, . . . NORTHAMPTON.
A Plea for Science in Agriculture.

EDWIN WEST ALLEN, ... AMHERST.
Success.

CHARLES SHEPARD PHELPS, . . . FLORENCE.
The Progress of Science.

*LUCIANO JOSÉ DE ALMEIDA, BANANAL, SÃO PAULO, BRAZIL.
The Commercial Relations of Brazil and the United States.

BENONI TEKIRIAN, ... YOZGAD, TURKEY.
The Eastern Problem.

*CHARLES WILLIAM BROWNE, . . SALEM.
The Theory of Rotation.

Music.

LEWIS CALVERT LEARY, ... AMHERST.
The Scientific Method in Agriculture.

*HEZEKIAH HOWELL, ... BLOOMING GROVE, N. Y.
The Science of Forestry.

JOEL ERNEST GOLDTHWAIT, . . . MARBLEHEAD.
The Power of Ideas.

GEORGE HOLCOMB BARBER, . . . GLASTONBURY, CT.
Law in Nature.

Music.

CONFERRING OF DEGREES by His Excellency, GEORGE D. ROBINSON.

Music.

PRAYER.

* Excused.

GRADUATES.

Allen, Edwin W., '85, Amherst, resident graduate, Agricultural College.

Allen, Francis S., '82, 135 West Forty-first Street, New York City, medical student.

Allen, Gideon H., '71, Winfield, Cowley Co., Kansas, insurance agent.

Almeida, Luciano José de, '85, Tres Barras, Province de São Paulo, Brazil, planter.

Aplin, George T., '82, East Putney, Vt., farmer.

Bagley, David A , '76.

Bagley, Sydney C., '83, 35 Lynde Street, Boston, plumber.

Baker, David E., '78, Newton Lower Falls, physician and surgeon.

Barber, George H., '85, College of physicians and surgeons, New York City, student.

Barrett, Joseph F., '75, 21 Beaver Street, New York City, Bowker Fertilizer Co., travelling salesman.

Barri, John A., '75, Water Street and Fairfield Avenue, Bridgeport, Conn., Chittenden, Barri & Sanderson, National Fertilizer Co.

Bassett, Andrew L., '71, Pier 36 East River, New York City, Bassett & Co., Transfer Co.

Beach, Charles E., '82, Care of Beach & Co., Hartford, Conn., farmer.

Bell, Burleigh C., '72, 16th and Howard Streets, San Francisco, Cal., druggist and chemist.

Bellamy, John, '76, 657 Washington Street, Boston, Nichols, Bellamy & Co., hardware and cutlery.

Benedict, John M., '74, 77 Bank Street, Waterbury, Conn., physician.

Benson, David H., '77, North Weymouth, Bradley Fertilizer Co., analytical and consulting chemist and superintendent of chemical works.

Bingham, Eugene P., '82, 13 Foster's Wharf, Boston, bleacher and manufacturer.

Birnie, William P., '71, Springfield, Birnie Paper Co.
Bishop, Edgar A., '83, Talladega, Ala., Talladega University, superintendent of farming department.
Bishop, William H., '82, Tongaloo, Miss., Tongaloo University, superintendent of farming department.
Blanchard, William H., '74, Westminster, Vt., farm laborer.
Boutwell, Willie L., '78, Leverett, farmer.
Bowker, William H., '71, 43 Chatham Street, Boston, president Bowker Fertilizer Co.
Bowman, Charles A., '81, 7 Exchange Place, Boston, office of Aspinwall & Lincoln, civil engineer.
Boynton, Charles E., '81, Haverhill, merchant.
Bragg, Everett B., '75, Glidden & Curtis, Tremont Bank Building, Boston, chemist.
Braune, Domingos H., '83, Nova Friburgo, Province of Rio de Janeiro, Brazil, planter.
Brett, William F., '72, Brockton, R. H. White & Co., 518 Washington Street, Boston, clerk.
Brewer, Charles, '77, P. O. Box 383, Syracuse, N. Y., florist.
Brigham, Arthur A., '78, Marlborough, farmer.
Brodt, Harry S., '82, Rawlins, Wyoming Territory, clerk.
Brooks, William P., '75, Imperial College of Agriculture, Sapporo, Japan, professor of agriculture.
Browne, Charles W., '85, Salem, farmer.
Bunker, Madison, '75, Newton, veterinary surgeon.
Callender, Thomas R., '75, Wellesley Hills, florist.
Campbell, Frederick G., '75, Westminster West, Vt., farmer.
Carr, Walter F., '81, 327 Hennepin Avenue, Minneapolis, Minn., Spalding & Carr, landscape architects and civil engineers.
Carruth, Herbert S., '75 ('85), 340 Washington Street, Boston, W. B. Clarke & Carruth, booksellers and importers.
Caswell, Lilley B., '71, Athol, civil engineer and farmer.
Chandler, Edward P., '74, Fort Maginnis, Montana, Chandler, Chamberlain & Co., wool growers.
Chandler, Everett S., '82, Beatrice, Gage Co., Nebraska, lawyer.
Chapin, Henry E., '81, American Cultivator, Boston, associate editor.
Chickering, Darius O., '76, Enfield, farmer.
Choate, Edward C., '78, 153 Brattle Street, Cambridge.
Clark, Atherton, '77, 131 Tremont Street, Boston, clerk.
Clark, John W., '72, North Hadley, farmer.
Clark, Xenos Y., '75 ('78), Pomona, Los Angeles Co., Cal., scientist.

* Clay, Jabez W., '75.

Coburn, Charles F., '78, Lowell, teller Five Cents Savings Bank and editor "Daily Citizen."

Cooper, James W., Jr., '82, East Weymouth, drug clerk.

Cowles, Frank C., '72, city engineer's office, Worcester, civil engineer.

Cowles, Homer L., '71, Amherst, farmer.

† Curtis, Wolfred F., '74.

Cutter, John A., '82, 213 West Thirty-fourth Street, New York City, student at Albany Medical College.

Cutter, John C., '72, Imperial College of Agriculture, Sapporo, Japan, consulting physician Sapporo Ken Hospital and professor of physiology and comparative anatomy.

Damon, Samuel C., '82, Lancaster, farmer.

Deuel, Charles F., '76, Amherst, druggist.

Dickinson, Richard S., '79, Columbus, Neb., farmer.

Dodge, George R., '75, Brighton, Bowker Fertilizer Co., superintendent.

Dyer, Edward N., '72, Kohala, Hawaiian Islands, government superintendent of schools.

Easterbrook, Isaac H., '72, Arnold Mills, R. I., farmer.

Eldred, Frederick C., '73, 128 Chambers Street, New York City, New York manager of Montpelier Carriage Co.

Ellsworth, Emory A., '71, 164 High Street, Holyoke, architect and mechanical and civil engineer.

Fairfield, Frank H., '81, South Duxbury, Standard Fertilizer Co., chemist.

Fisher, Jabez F., '71, Fitchburg, freight cashier, Fitchburg Railroad Co.

Fiske, Edward R., '72, 625 Chestnut Street, Philadelphia, Penn., Follwell Bro. & Co., merchant.

Flagg, Charles O., '72, Abbott Run, R. I., farmer.

Flint, Charles L., Jr., '81, 7 Exchange Place, Boston, Dole & Flint, brokers.

‡ Floyd, Charles W., '82.

Foot, Sandford D., '78, 101 Chambers Street, New York City, Kearney, Foot & Co., file manufacturers.

Fowler, Alvan L., '80, address Westfield, cattle raiser, California.

Fuller, George E., '71.

Gladwin, Frederic E., '80, 38 California Street, San Francisco, Cal., assayer.

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* Died Oct. 1, 1880, of pneumonia, at New York City.

† Died Nov. 8, 1878, of inflammation of the brain, at Westminster.

‡ Died Oct. 10, 1883, of consumption, at Dorchester.

Goldthwait, Joel E., '85, Marblehead, Harvard Medical School, student.
Goodale, David, '82, Marlborough, farmer.
Green, Samuel B., '79, Newton Highlands, W. C. Strong's hothouses, superintendent.
Grover, Richard B., '72, Old South Church, Boston, associate pastor.
Guild, George W. M., '76, 46 Chauncy Street, Boston.
Hague, Henry, '75, South Worcester, St. Matthew's, rector.
Hall, Josiah N., '78, Sterling, Weld Co., Col., physician.
Harwood, Peter M., '75, Barre, farmer.
Hashiguchi, Boonzo, '81, department of commerce and agriculture, Tokio, Japan, president Government Sugar Beet Co.
*Hawley, Frank W., '71.
Hawley, Joseph M., '76, Berlin, Wis., C. A. Mather & Co., banker.
Herms, Charles, '84, O Bannon Station, Jefferson Co., Ky., stockbreeder.
† Herrick, Frederick St. C., '71.
Hevia, Alfred A., '83, 21 Cortlandt Street, New York City, Washington Life Insurance Co., agent.
Hibbard, Joseph R., '77, Stoughton, Wis., farmer.
Hillman, Charles D., '82, Fresno City, Cal., nursery man.
Hills, Joseph L., '81, Beaufort, South Carolina, Phosphate Mining Co., limited, chemist.
Hitchcock, Daniel G., '74, Warren, no business.
Hobbs, John A., '74, Bloomington, Neb., farmer.
Holland, Harry D., '84, Amherst, S. Holland & Son, clerk.
Holman, Samuel M., Jr., '83, Attleborough, manufacturer.
Holmes, Lemuel Le B., '72, Mattapoisett, lawyer.
Howard, Joseph H., '82, Minnisela, Butte Co., Dak., cattle raiser.
Howe, Charles S., '78, Akron, Ohio, Buchtel College, professor of mathematics.
Howe, Elmer D., '81, Marlborough, farmer.
Howe, George D., '82, North Hadley, clerk.
Howe, Waldo V., '77, Newburyport, no business.
Howell, Hezekiah, '85, Monroe, Orange Co., N. Y., farmer.
Hubbard, Henry F., '78, 94 Front Street, New York City, with John H. Catherwood & Co.
Hunt, John F., '78, Sunderland, market gardener.
Jones, Elisha A., '84, Logan, Pa., superintendent of "Woodfield Farm."

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*Died Oct. 28, 1883, of congestive apoplexy, at Belchertown.
†Died Jan. 19, 1884, at Lawrence.

Kendall, Hiram, '76, Providence, R. I., Kendall Manufacturing Co., superintendent and chemist.

Kimball, Francis E., '72, 15 Union Street, Worcester, E. W. Vaill, book-keeper.

Kingman, Morris B., '82, resident graduate, Agricultural College.

Kinney, Burton A., '82, Portland, Me., Signal Corps, United States Army.

Knapp, Walter H., '75, Newtonville, florist.

Koch, Henry G. H., '78, Sixth Avenue and Twentieth Street, New York City, H. C. F. Koch & Son.

Ladd, Thomas H., '76, care William Dadmun, Watertown, no business.

Leary, Lewis C., '85, Cambridge, Harvard Divinity School, student.

Lee, Lauren K., '75, Valley Springs, Dak., dealer in grain and flaxseed.

Lee, William G., '80, Holyoke, office city engineer, draughtsman.

Leland, Walter S., '73, Concord, State Prison, officer.

Leonard, George, '71, Springfield, lawyer.

Libby, Edgar H., '74, Greenfield, publisher, "American Garden."

Lindsey, Joseph B., '83, Pawtucket, R. I., L. B. Darling, Fertilizer Co., chemical agent.

Livermore, Russell W., '72, Pates, Robeson Co., North Carolina, merchant.

Lovell, Charles O., '78, Northampton, photographer.

Lyman, Asahel H., '73, Manistee, Mich., druggist.

Lyman, Charles E., '78, Middlefield, Conn., farmer.

*Lyman, Henry, '74.

Lyman, Robert W., '71, Belchertown, lawyer.

Mackie, George, '72, Attleborough, physician.

Macleod, William A., '76, 60 Devonshire Street, Boston, lawyer.

Mann, George H., '76, Sharon, Cotton Duck Mills, superintendent.

Martin, William E., '76, Excelsior, Minn., Martin & Sigafoos, grocers.

May, Frederick G., '82, Orlando, Orange Co., Fla., contractor and orange grower.

Maynard, Samuel T., '72, Amherst, Massachusetts Agricultural College, professor of botany and horticulture.

McConnel, Charles W., '76, 170 Tremont Street, Boston, dentist.

McQueen, Charles M., '80, 92 Commercial Bank Building, Chicago, Ill., president Progressive Publishing Co.

Miles, George M., '75, Miles City, Montana, Miles & Strevell, jobbers of hardware and dealers in live stock.

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* Died Jan. 8, 1879, of pneumonia, at Middlefield, Conn.

Mills, George W., '73, Medford, physician.
Minor, John B., '73, New Britain, Conn., Minor, Nichols & Co., box manufacturers.
Minott, Charles W., '83, Three Rivers, Ruggles & Minott, nurserymen.
Montague, Arthur H., '74, South Hadley, farmer.
Morey, Herbert E., '72, 49 Haverhill Street, Boston, Morey, Smith & Co., merchant.
* Morse, James H., '71.
Morse, William A., '82, Thompson's Island, Boston Harbor, assistant superintendent.
Myrick, Herbert, '82, Springfield, agricultural editor, "New England Homestead."
Myrick, Lockwood, '78, Cotton Exchange Building, Hanover Square, New York City, Williams, Clark & Co., chemical agent.
Nichols, Lewis A., '71, Danvers, Boston City Water Works, civil engineer.
Norcross, Arthur D., '71, Monson, postmaster.
Nourse, David O., '83, Bolton, farmer.
Nye, George E., '77, 70 Exchange Building, Union Stock Yards, Chicago, Ill., G. F. Swift & Co., book-keeper.
Osgood, Frederick H. (M. R. C. V. S.), '78, 238 Pine Street, Springfield, veterinary surgeon.
Otis, Harry P., '75, Leeds, Northampton Emery Wheel Company, superintendent.
Page, Joel B., '71, Conway, farmer.
Paige, James B., '82, Prescott, F. B. Paige & Son, "Mellen Valley Fruit Farm."
Parker, George A., '76, Halifax, Old Colony Railroad, landscape gardener.
Parker, George L., '76, Dorchester, florist.
Parker, Henry F., '77, 5 Beekman Street, New York City, mechanical engineer.
Parker, William C., '80, 28 School Street, Boston, real estate, insurance, mortgages.
Peabody, William R., '72, Atchison, Kansas, Atchison, Topeka & Santa Fé Railroad, general agent.
Penhallow, David P., '73, Montreal, Canada, McGill University, professor of botany and vegetable physiology.
Perkins, Dana E., '82, care C. M. Winchell, U. S. Survey Boat, Tennessee, Mississippi River Commission.

* Died June 21, 1883, of Bright's disease, at Salem.

Peters, Austin, '81 (M. R. C. V. S.), Room 28, Adams Building, Court Street, Boston, Veterinary to Massachusetts Society for Promoting Agriculture.

Phelps, Charles H., '76, 42 Elizabeth Street, New York City, chair manufacturer.

Phelps, Charles S., '85, Amherst, resident graduate, Agricultural College.

Phelps, Henry L., '74, Southampton, farmer.

Plumb, Charles S., '82, Geneva, N. Y., New York Agricultural Experiment Station, assistant director.

Porter, William H., '76, 36 Bromfield Street, Boston, Harris, Rogers & Co., publishers.

Porto, Raymundo M. da S., '77, Para, Brazil, planter.

Potter, William S., '76, Lafayette, Ind., Rice & Potter, lawyer.

Preston, Charles H., '83, 161 Tremont Street, Boston, with Dr. B. F. Davenport, State analyst, chemist.

Rawson, Edward B., '81, Lincoln, Loudoun Co., farmer.

Renshaw, James B., '73, Plainview, Minn., clergyman.

Rice, Frank H., '75, Hawthorne, Nev., county recorder.

Richmond, Samuel H., '71, Higley, Orange Co., Fla., civil engineer and surveyor.

Ripley, George A., '80, 1 Wyman Street, Worcester, farmer.

Root, Joseph E., '76, 72 Pearl Street, Hartford, Conn., physician and surgeon.

Rudolph, Charles, '79, Mitchell, Dak., lawyer.

Russell, William D., '71, Turner's Falls, Montague Paper Co.

Salisbury, Frank B., '72, Kimberley Diamond Fields, South Africa, trader.

Sears, John M., '76, Ashfield, farmer.

Shaw, Elliot D., '72, Holyoke, florist.

Sherman, Walter A., '79, 182 Central Street, Lowell, veterinary surgeon.

Shiverick, Asa F., '82, Wood's Holl, Pacific Guano Co., chemist.

Simpson, Henry B., '73, Stafford C. H., Va., farmer.

Smead, Edwin B., '71, Hartford, Conn., Watkinson Juvenile Asylum, superintendent of farm schools.

Smith, Frank S., '74, Albany Woolen Mills, Albany, Wis., manufacturer.

Smith, George P., '79, Sunderland, farmer.

Smith, Hiram F. M., '81, 68 Sumner Street, Worcester, physician.

Smith, Llewellyn, '84, Amherst, State Agricultural Experiment Station, assistant chemist.

Smith, Thomas E., '76, West Chesterfield, manufacturer.

Snow, George H., '72, Leominster, farmer.

Somers, Frederick M., '72, 47 Exchange Place, New York City, journalist.

* Southmayd, John E., '77.

Southwick, Andre A., '75, care Beach & Co., Hartford, Conn., superintendent "Vine Hill and Ridge Farms."

Spalding, Abel W., '81, 327 Hennepin Avenue, Minneapolis, Minn., Spalding & Carr, landscape architects and civil engineers.

Sparrow, Lewis A., '71, 19 South Market Street, Boston, Judson & Sparrow, dealers and manufacturers of fertilizers.

Spofford, Amos L., '78, West Newbury, farmer.

Stockbridge, Horace E., '78, Imperial College of Agriculture, Sapporo, Japan, professor of chemistry and geology.

Stone, Almon H., '80, North Tarrytown, N.Y., Storrs Military Institution, teacher.

Stone, Winthrop E., '82, Amherst, State Agricultural Experiment Station, assistant chemist.

Strickland, George P., '71.

Swan, Roscoe W., '79, 32 Pleasant Street, Worcester, physician.

Taft, Cyrus A., '76, Whitinsville, draughtsman and machinist.

Taft, Levi R., '82, Columbia, Mo., Missouri Agricultural College, professor of horticulture.

Taylor, Alfred H., '82, Burnett, Neb., dealer in live stock.

Taylor, Frederick P., '81, Athens, Coke Co., East Tennessee, farmer.

Taylor, Isaac N., Jr., '85, Haddonfield, N. J., teacher.

Tekirian, Benoni, '85, Worcester, merchant.

Thompson, Edgar E., '71, East Weymouth, teacher.

Thompson, Samuel C., '72, 62 East 127th Street, New York City, Department of Public Works, civil engineer.

Thurston, Wilbur H., '82, Stouts P. O., Rome, O., superintendent "Tusculum Farm."

Tucker, George H., '71, Minto, Dak., civil engineer.

Tuckerman, Frederick, '78, Amherst, physician and lecturer, Massachusetts Agricultural College.

Urner, George P., '76, Melville, Gallatin Co., Montana, sheep raiser.

Wakefield, Albert T., '73, 301 Main Street, Peoria, Ill., physician.

Waldron, Hiram E. B., '79, North Rochester, farmer.

Ware, Willard C., '71, 255 Middle Street, Portland, Me., Boston & Portland Clothing Co., manager.

Warner, Clarence D., '81, Amherst, Massachusetts Agricultural College, professor of mathematics and physics.

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* Died Dec. 11, 1878, of consumption, at Minneapolis, Minn.

Warner, Seth S., '73, Northampton, Bowker Fertilizer Co., agent.
Washburn, John H., '78, Mansfield, Conn., Storrs Agricultural School, professor of chemistry.
Webb, James H., '73, 69 Church Street, New Haven, Conn., Alling & Webb, attorneys and counsellors at law.
Wellington, Charles, '73, Amherst, Massachusetts Agricultural College, associate professor of chemistry.
Wells, Henry, '72, 48 Farringdon Street, London, E. C., England, care Lawrence Bros., business.
Wetmore, Howard G., '76, 41 West Ninth Street, New York City, physician.
Wheeler, Homer J., '83, Amherst, State Agricultural Experiment Station, assistant chemist.
Wheeler, William, '71, Concord, civil engineer.
Whitney, Frank Le P., '72, 2179 Washington Street, Jamaica Plain, Boston, boot and shoe business.
Whitney, William C., '72, Tribune Building, Minneapolis, Minn., architect.
Whittaker, Arthur, '81, Needham, farmer.
Wilcox, Henry H., '81, Nawiliwili, S. I., sugar planter.
Wilder, John E., '82, 179 Lake Street, Chicago, Ill., with Wilder & Hale, dealers in leather.
Williams, James S., '82, North Glastonbury, Conn., farmer.
Williams, John E., '76, Amherst, editor "Amherst Record."
Winchester, John F., '75, Lawrence, veterinary surgeon.
Windsor, Joseph L., '82, 2020 State Street, Chicago, Ill., private secretary, office Chicago Cable Co.
Wood, Frank W., '73.
Woodbury, Rufus P., '78, Kansas City, Mo., news and telegraph editor of "Kansas City Daily Times."
Woodman, Edward E., '74, Danvers, E. & C. Woodman, florists.
Wyman, Joseph, '78, 126 Washington Avenue, Chelsea, bookkeeper at 52 Blackstone Street, Boston.
Zeller, Harrie McK., '74, Hagerstown, Md., Baltimore & Ohio Telegraph Co., manager of commercial office.